Variable Geometries of Connection:

Urban Digital Divides and the Uses of Information Technology

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Abstract

This paper proposes a new way of conceptualising urban 'digital divides'. It focuses on the ways in which Information and Communication Technologies (ICTs) unevenly affect the pace of life within the urban environment. Based on a detailed case study of how ICT s are being used in an affluent and a marginalised neighbourhood in Newcastle-upon-Tyne, the paper suggests that urban digital divides need to be understood as more than uneven patterns of access. They emerge in this work as more than the presence or absence of specific technological artefacts. Rather, it is argued that different styles and speeds of technologically mediated life now work to define urban socio-spatial inequalities. The paper distinguishes between two such key styles and speeds. First, the paper argues that affluent and professional groups now use new media technologies pervasively and continuously as the 'background' infrastructure to sustain privileged and intensely distanciated, but time-stressed, lifestyles. Second, more marginalised neighbourhoods tend to be characterised by instrumental and episodic ICT usage patterns which are often collectively organised through strong neighbourhood ties. For the former, mediated networks help orchestrate neighbourhood ties; for the latter it is those neighbourhood ties that enable online access.

Introduction

Whilst research on the so-called urban 'digital divide' is well established, it has thus far tended to de dominated by aggregate accounts charting of the interaction of two variables - access to the Internet and socio-spatial inequality (Compaine, 2001, Holloway, 2005, Loader, 1998; see Graham, 2002, 2004). Such research has successfully traced how the leads and lags of on-line access move, over time, between different social groups and geographical areas, whether regionally through economies, or as rural and urban contrasts, as access to Information and Communications Technologies (hereafter 'ICTs') diffuse unevenly through society.

Thus far, however, such aggregate and quantitative depictions of wide-scale internet diffusion processes have dwarfed efforts to look at the effects that access, or lack of access, to ICTs – and all the transactional, informational, and communicational worlds that they can open up – have on individuals, households, and neighbourhoods. This has led to three major research problems which we seek to address in the current paper. First, digital divide literature tends to reduce communication and information technologies to a set of artefacts whose distribution can be plotted against socio-demographic variables. This, we suggest, puts too much emphasis on artefacts and reads off their uses rather deterministically as stable and unchanging, often assuming they give some sort of 'technological push' to society -- for good or ill. Thus, the challenge is to unpack the practices and modalities of using ICTs and the ways they configure users and users configure them. Second, work which focuses upon ways of using ICTs tends to be micro scale and eschews dealing with broader social consequences. Third, accounts tend to examine not just individual technologies but individualised users – downplaying socialised

use and outcomes. It is not sufficient to simply map out aggregate urban digital divides by analysing aggregate ICT users and activities. Rather, we need to look at socio-spatially embedded actions and synergies between multiple technologies used in places with mutually overlapping effects occurring through those places.

Multispeed Cities: Beyond Quantitative Mappings of Urban Digital Divides

By way of a critical review of urban digital divides literatures, it is worth elaborating on these three points in a little more detail. Taking the first, much work on digital divides has been resolutely aspatial. Its main focus thus far has been to relate the presence or absence of specific technical artefacts -- such as the ownership and ability to use PCs (Selwyn 2004) -- with socio-demographic variables. Occasionally, these patterns are spatially referenced to geographical units at which level the data was collected – usually at supra-urban or regional scales. That is the focus is the distribution of access, usually socially (for US data see National Telecommunications and Information Administration 1999; 2000; for the UK Policy Action Team 15 2000; Bromley 2004) but in a few works spatially -- such as focusing on variations in connectivity between cities (Townsend 2001), and sometimes at the intra-urban level (Baum, van Gellecum et al. 2004; Holloway 2005). The literature on the digital divide thus has gaps in terms of scale. These works do not tend to focus upon the consequences of using ICTs, even though they often imply benefits through ‘digital inclusion’. They chart the distribution of artefacts and tend to assume their use and effects. Crucially, however, they also largely ignore the social consequences of ICT-mediated social inequalities. While theories make often sweeping claims, empirical work rarely looks to the effects on daily life in cities resulting from differential contours of the digital landscape. Research is particularly lacking which explores what it means for

individuals, groups and neighbourhoods to *not* have access to ICTs in a world where personal, welfare and leisure services are increasingly being fundamentally restructured to orient themselves towards normalised consumers who do have ICT access. Notably, the urban impacts of using ICTs are not just confined to the household. They quickly cascade into other spheres and scales – producing second and even third order effects, in, say, local service provision and community dynamics. To adapt Elizabeth Shove's words, ICTs 'not only permit people to fulfil necessary practices, they have the further consequence of modifying what those practices are and how they are 'normally' configured and structured' (2002, 2).

Through such processes of normalisation, ICT-mediated economic and social relationships provide opportunities for restructuring the time-space dynamics of everyday lives, service supply regimes, and the broader time-space patterns of urban development. The dynamic and relational geographies of such transitions reconstitute cities as key spatial pivots within telescoping scalar relations, operating at near instantaneous speeds, from the scale of the body to the transnational (Crang 2000). It follows that those groups, neighbourhoods and communities within cities who are marginalised from ICT-mediated links will be excluded not just from physical access points to technology. Just as importantly, they will be distanced from the complex and multiscale constellations of increasingly normalised electronic flows, transactions, and exchanges which operate within, through and beyond their neighbourhoods. Consequently, the 'social and economic cores and peripheries of the global information 'age', rather than being continents apart, now lie geographically adjacent to each other within individual cities' (Graham 2002, 34).

Starting from these differential processes of ICT-mediation, it follows that, on a neighbourhood level within cities, we may find the emergence of a kind of 'multi-speed'

urbanism – with some areas still stuck in an urban 'slow' lane -- still reliant on the arrays of physical cash, face to face services, and physical service offices which are increasingly being marginalised or withdrawn as ICT-mediated service systems become both normalised and dominant (Graham, 2002). Equally, we may also find other hyper-connected areas where residents experience the stress of a rapidly accelerating life – where technologies that promised to ameliorate the tensions of a busy world, simply enable ever-more frenetic and multiscalar patterns of activity, coordination and multi-tasking to be performed simultaneously, at greater and greater speeds, and increasing levels of complexity.

Opening Black Boxes: Doing Things with ICTs

Turning to the second problem, there is a paucity of work in urban studies that examines what people do with ICTs. Thus, we tend to have a dichotomous understanding of ICTs and society where one is assumed to 'impact' on the other to varying degrees in abstract, generalised, and deterministic ways. Indeed, it is remarkable how quickly terms like ICTs and connectivity become linguistic 'black-boxes' that bundle together a whole assemblage of technologies and assume or imply a raft of resulting technologically-mediated social practices. So, despite some excellent early work, (e.g. Silverstone and Hirsch 1992), urban analyses rarely attend to how new technologies are configured and 'domesticated', in everyday practice, as means of re-making the time-space fabrics, and the logistical dynamics, of everyday urban life. This is partly because 'very little work has been done at the local scale' (Crampton 2003, 19).

Outwith urban studies, Human Computer Interaction (HCI) studies have successfully unpacked the over abstract and generalised terms used in the policy literature. Thus,

multiple technologies emerge here as being configured by people in their practical engagements in daily life. In terms of users, the implication is that we should not be thinking of singular elements but also the interaction of phones (landline and mobile) with computers, with embedded processors, with television (digital and analog). Problematically, however, the dominant notion of the urban digital divide has tended to rely on simplistic notions of what is meant by 'ICTs'. Very often, this term is equated purely with Internet computers (Selwyn 2004, 346). Only very rarely have researchers explored the ways in which multiple forms of technology are enrolled simultaneously and in parallel to support shifts in the time-space and logistical dynamics of urban life. Consequently, there is very little research thus far which explores how mobile phones, landline phones, internet computers and digital TV systems are being used together, as combined and interconnected systems, to support changing practices and patterns of urban everyday life.

The need to focus on the interactions of multiple technologies and forms of access is thrown into relief by the example of mobile workers who may well be thus using multiple ICT technologies to turn transit or leisure spaces into work space. Thus, intricate 'juggling' amongst multiple uses of different technologies may be needed to make such continuous online mobility a possibility. The dance of people and technologies occurs in detail as things are made into workable solutions -- not pristine or optimal technical specifications -- by user practices (Brown and O'Hara 2003). Despite all the accounts of speed and the ideologies of 'wireless' worlds and ubiquitous computing, anyone with personal experience of ICT use knows that the connecting of various devices is often a suboptimal 'kludge' driven by 'good enough' technical fixes, user preferences and needs (Mackenzie 2005).

The example of mobile phones throws light on this reconfiguration of practice and technology. Mobile phones, like satellite or cable TV, rarely figure in discussion of digital

connectivity. Yet they are intricately bound into people's lives, and have rather different patterns of 'access' than the internet. Text messaging is an almost paradigmatic example of unintended uses, developing from a facility originally intended for network engineers (Agar 2004). The mobile phone is not used in the same way as a landline – despite its functional similarities. Instead, mobiles have been endowed variously with more 'personality', being treated as a friend or fashion item, different and shifting amounts of social status, being connected to and incorporated into other ICTs, and, increasingly, embodying different communication technologies in themselves (with text, visual, video, web browsing as well as audio). Work on mobile phones for instance would suggest taking seriously the spatial transformations enabled in using these artefacts. In its use a mobile moves from vital work tool, to technology of reassurance often bought for 'safety', reassuring carers about contact with roaming youngsters while sometimes ending up resented by those bearers as a tool of surveillance. Yet, within people's lives, the mobile also becomes an essential urban navigational tool (Townsend 2000, page 88; Laurier 2001), allowing meetings of all kinds to be flexibly negotiated in time and space (Jain 2002). As such mobiles involves and transform older technologies that manage 'presence availability' (Green 2002), transforming the boundaries of public and private interaction and reappropriating marginalised spaces in the city for work and leisure. What this highlights is that ICTs are practiced and put to use in multiple ways in configurations with other technologies, spaces and domains of physical interaction and mobility.

While there is a rich ethno-methodological tradition looking at 'doing communication' this work tends to shy away from addressing the broader consequences of such practices. ICTs are neither coherent and discrete objects nor are they 'ends in themselves'. Using them requires competences and represents an accomplishment, but one which is often about accomplishing something other than the intrinsic satisfaction of getting a network to

work. So, we need to think how various ICT artefacts and practices link into and enable changes in the orchestration of everyday life (Crang, Crosbie et al. 2006). Whilst there is an emerging body of work on household technologies and ICTs, we remain largely uninformed about what the proliferation of ICT-mediated relationships means for neighbourhoods and place-based communities (Little 2000; Bridge and Giullari 2004).

Collective Mediations of ICT Use

Returning to our third problem with urban digital divide literatures, such work has, thus far, been almost completely pre-occupied with use of ICTs by individual people or households. Survey research on urban digital divides has concentrated overwhelmingly on apparently individualised ICT users and functions (eg National Telecommunications and Information Administration 1999; 2000; 2002). With some notable exceptions (e.g. Morley, 2000, Hampton and Wellman, 2002), it is widely assumed within such surveys that ICTs are used by individuals or discrete household units with little regard to the collective logistical and time -space dynamics of their work, home, or social lives.

Such a perspective ignores the ways in which collective and social relationships and networks, grounded within households, neighbourhoods and cities, help to mediate how ICTs are domesticated, shaped, and used. It also ignores how ICT access and feedback shaping use are mediated collectively in places. Put simply email access, for example, is pointless if you have nothing suitable to say or no one with whom communicating that material would be meaningful or useful. As a practice, as much as individual choice, e-mail use depends on others existing in a social network being available and responsive.

The Approach and Structure of this Paper

To address these three research gaps, this paper focuses on the ensemble of information technologies and practices, grounded in everyday social lives, that together are shaped to support varied reconfigurations in the logistics of everyday urban life. The result, we argue, is the emergence of a 'multispeed urbanism' which structures urban digital divides based on communities' varying abilities to hook up to multiscale and increasingly normalised electronic flows -- and the urban restructuring dynamics that are increasingly derived from them. Our focus here thus falls on the different ways in which multiple ICTs are unevenly reconfiguring the logistical time-space practices of everyday urban life at the level of broadly 'included' and 'excluded' neighbourhoods within cities. We do not just attend to 'online division' as an indicator of exclusion. Rather, we are concerned with the ways in which uneven geographies of ICT mediation within cities may function, or be performed, as an engine of exclusion and the oft-trumpeted possibilities offered for greater inclusion. We therefore agree with Bromley's (2004) stress on the fundamental social consequences of ICTs, though not the solely positive outcomes. She points out, in particular, that:

> 'the internet … is a portal which has the potential to liberalise access to a whole host of resources and opportunities, and to increase social connections. ... It has the capacity to impart knowledge to groups which have tended to be excluded from traditional information sources, to provide new channels of communication, and to open up access to goods and services previously denied or impeded by older technologies or methods of exchange.' (2004, 73)

We would add that, as Internet use becomes normalised in daily routines, those without access may find access and services previously supplied otherwise becoming more inaccessible.

The discussion that follows falls into two parts. As a means of laying the conceptual foundations for the following analysis, we begin with a brief theoretical discussion. This addresses two key conceptual problems: first, how geographies of multispeed urbanism might be imagined, and, second, how urban digital divides might be affected by the alleged speeding-up of urban living and the space-time configurations of cities that result from ICT use. The second part of the paper then outlines findings from a detailed case study of the ways in which ICTs are being enrolled to reconfigure the logistics and time-spaces of urban everyday life in two highly contrasting neighbourhoods within one city: Newcastle-upon-Tyne in the UK. The case study addresses how the differentials of demographics, social capital and neighbourhood social organisation inflect the use of ICTs in practice in the two neighbourhoods. This analysis highlights two themes in particular. First, rather than presence or absence of technologies, it emphasises more fluid urban digital divides constituted through varying time-space rhythms of ICT use. Here, a pervasive, ubiquitous presence is seen to exist amongst more affluent and included users which contrasts sharply with more episodic and instrumental usage of ICTs amongst less affluent ones. Second, this section looks at a blurring of access patterns through locally embedded, socialised use, which appears to be especially important amongst marginalised neighbourhoods associated with episodic styles of ICT use.

Imagining Multispeed Urban Landscapes

The preceding critique and reconceptualisation of notions of urban digital divides, based on the central importance of the interplay of ICTs, time-space and the dynamic processes of urban everyday life, raises a key question: how might we imagine the social and geographical landscapes of urban digital divides within cities characterised by multispeed urbanism?

Mutispeed Cities as 'Tame' and 'Wild' Zones?

Scott Lash's (2002) work offers a provocative lead here. He contrasts what he calls the 'live' and 'dead zones' of cities defined by the presence (or relative absence) of the flows of information within such 'zones' (pages 28-9). This he pairs with *responses* to such information, referring to a parallel urban geography of what he calls 'tame' and 'wild' zones. Thus, Lash produces a four-way typology. *Dead/Tame* zones are characterized by majoritarian ethnic groups clinging to traditionalist values in the face of change. *Live/Tame* zones are dominated by the 'informational bourgeoisie', with affluent connected populations doing comfortably, and thus relatively conservative, as regards the social order. *Live/Wild* zones are marked by the emergence of new cultural forms driven by the 'cultural capital faction of the post—industrial middle class'. Finally, *Dead/Wild* zones are areas of social decomposition, characterized by marginal groups, cultural change and fluidity. Such a schema addresses not just uneven informational landscapes within cities; it also highlights that intra-urban social geographies and the informational environment interact. Informational environments are thus seen to affect neighbourhoods, which reciprocally affect how that information may be accessed and used.

Lash's typology, however, is both dualistic and freighted with valorizations that privilege the 'wild' where even the urban information 'have-nots' are exciting, and 'cultural

creatives' drive innovative urbanism (see for instance Pratt 2002). This loading of the dice, especially for the live/wild zone, suggests that we have something of a fashioning of a self-image or, at least, fantasy identity for information professionals. Such an argument has led Frank Webster to voice:

> 'an uneasy suspicion that many commentators, from academe, business, politics and media, in effect write themselves on to the city today. That is, much of the writing of the 'new urbanism', about the city's dynamism, its flexibility, its stimulation, is diversity, its computer communications technologies, its style, its cosmopolitanism, its cultures, seems to be, well, our story. We are indisputably part of the knowledge ´elite, and we tell our own favoured tale as regards the city of the future' (2001, 42).

While such reflexive understandings of an urban 'information revolution' are vital to our analysis, we do not want to be seduced by a walk on the wild side. We wish to know what 'taming' such technologies is all about within the context of urban digital divides.

Multispeed Cities and the Uneven Acceleration of Urban Everyday Lives

If we look at information 'haves', we see a picture, or at least a self-image, of accelerating lives. Here information technology is offered as a solution to managing a '24/7' lifestyle (for the 'wild'), or the competing time demands of work, family and self (for the 'tame'). In essence then, far from a fantasy of speed, many of the 'hyper-connected' in the latter camp may well experience a stressful and debilitating time-squeeze as the logistical demands of intensification and speed-up become increasingly problematic (Eriksen 2001).

Stories of acceleration and squeezing more activities into the day are a key part of the imaginary of the digitisation of urban life. The flipside is that speeded-up lives, orchestrated by suites of always-on ICTs, entail double and triple-shifting women and enable long hours by over-achieving men in informational sectors (Perrons 2003).

On the one hand, then, ICTs are apparently adopted as a time-saving technology in the face of mounting pressures. So a variety of communication media are now sold as a collective ensemble of systems and infrastructures which together allow more activities to be crammed in lifestyles characterised increasingly by multi-tasking, always-on connectivities, the continuous interactions of multiple scales, and fluid coordination. On the other, empirical analysis suggests that 'free' time is generally growing although many with diverse home and work activities competing for time feel 'busyness' as a pressure (Gershuny 2000, 2002). Moreover various technologies have not simply freed up time previously spent on chores – more often they reallocate that time within a household or even expand chores, by increasing frequencies of activities (for a debate see Bittman, Rice et al. 2004; Gershuny 2004).

For digital media there has been debate about time online displacing other ("real") social activities – with accounts portraying alienated net users, where as Mitchell pithily put it: 'they picture us all huddled at home in our underwear typing email messages to one another' (1999, page 91). As Gershuny (2003) points out, the 'real' versus mediated interaction literature assumes that online and media time is a 'final activity' that is substituted for others. However, rather than simply being a goal in themselves, activities mediated through ICTs -- such as e-shopping, contacting people or information searching -- often enable or orchestrate other 'offline' activities and goals. Much early research focused upon enthusiastic early adopters, who also indeed liked to see themselves as

harbingers of change. Now with widespread adoption, and mass diffusion, we can focus rather more upon the ‘quiet pragmatists’ who form a majority using the technology conservatively and whose ‘motivation for using technology is dominated by everyday concerns’ (Crabtree, Nathan et al. 2002, page 3, 26-8).

Four important points emerge here. First, ICTs may -- but only may – facilitate quicker connectivity, communications or transactions than traditional physical access – either by design, as a privilege of mediated access (effectively a ‘bypass’ or queue jumping, see Graham, 2005), or unintentionally (if, for instance, an e-shop discourages product browsing, purchases may be more ‘efficient’).

Second, ICTs enable timeshifting activities to formerly unavailable time slots as the rigid time-space routines of traditional face-to-face work and urban consumption within mass, industrialised, cities, give way to flexible and complex orchestrations involving geographically distanced access combined with continuous temporal opportunities for engagement. Thus, online grocery shopping or phone banking may be no quicker at all. But, if they can be done in the evening, they may fit around other more valued or constrained tasks – such as work hours, child care, or so forth. All these outcomes are contingent -- phone banking may beat travelling to the bank and physical queuing, or being placed in a phone queue preference system may not be any advantage. Equally, online banking may be faster than both or getting access on a secure PC, starting it, getting a connection and processing may be just as slow.

Third, more than just time use constraints, ICT mediations also enable the relocating of some – but only some – activities within, through, and beyond, the material spaces of cities. Thus, both phone and online banking do spatially relocate tasks and thus reduce

travel time and may allow multitasking whilst doing banking, but being able to tell childcare providers on your mobile phone that you will be late does not make you get there quicker (Jarvis 2005).

Finally, mobilised devices can enable users to convert formerly ‘dead’ space(-time) -- such as the bus stop, or indeed the bus -- to connect with people not physically present. Thus, multitasking is moved out of the home, facilitating complex processes through which electronic and physical roaming within and between cities are continuously recombined in new ways.

These latter two points exemplify the possibilities of the intensified use of time through ICTs -- not simply moving it around within a fixed time budget. This complex pattern may start to explain mixed effects where analyses suggest that ‘each extra minute on the Internet is associated with about one-third of a minute reduction in personal care time, one fifth of a minute less visiting, half a minute less watching television ..[and], nearly one-fifth of a minute of *extra* time devoted to going out — eating or drinking in a public place, going to the theater or cinema’ (Gershuny 2003, 158, 164). Longitudinal measurement of changes in time use by people adopting ICT technologies actually suggests an even stronger positive relationship with socializing and specifically with going out to public places. Time-use figures also suggest that people with home web access tend to work longer hours and sleep for fewer, though there is no simple causal inference here. This highlights that while, so far, we have couched this changing online and communication time pattern in terms of consumption, when looking at the ‘hyper-connected’ who are often bound up in the transnational informational economy at work, what we also have is the de-localisation of work and its relocation into the home – as out of hours, weekend work and so forth. Thus, ‘creative work’ often involves periods of intense, and not entirely

predictable, activity, tied into the dynamics of transnational urban networks. But these periods can be followed by periods of slack time. Thus, 'creative' workers work flexible hours in order to deal with volume and rhythm of work (Perrons 2003, 70, 84).

Exploring Multispeed Urbanism: A Case Study of Newcastle upon Tyne

In what follows we seek to build on the above theoretical and conceptual discussions about the connections between urban inequalities, ICTs and the changing logistics of everyday life through a detailed case study of two neighbourhoods in Newcastle-upon-Tyne. This enables us to focus on the varied ways in which affluent and marginalised users are using ICTs to reshape the logistics of daily life within one city. Newcastle was selected as the subject of research for two reasons. First, at a regional scale, the North East of England is one of the UK's 'lagging regions' in terms of ICT adoption. In 2003-4, for example, the region had the lowest rates of net usage in the UK (43% as against London's 64%) and the lowest rates of home Internet access in England (41% as against London's 56%) (Office of National Statistics (ONS) household and omnibus surveys). However, regions are poor reflectors of varying rates of ICT access *within cities*.

Second, then, Newcastle offers contrasts where neighbourhoods might share public and private urban services but be worlds apart in terms the dynamics of multispeed urbanism, as stark variations of income, social class, levels of digital inclusion or exclusion, and the time-space dynamics of ICT-mediated urban life, played out differently across the City's affluent and more marginalised neighbourhoods.

Within the city we selected two highly contrasting neighbourhoods for study which are barely a mile apart geographically: Blakelaw and Jesmond. Blakelaw is in the bottom 20% wards on the UK Government's index of social deprivation; Jesmond is among the wealthiest 20%. Nationally, home internet access in the UK varies from around 85% for the wealthiest quintile down to 15% for the poorest quintile (ONS 2003-04). This gap, moreover, is widening in both the UK and the US (Bromley 2004, 78; National Telecommunications and Information Administration 2002). The two wards were thus selected because they presented remarkably differing profiles on a range of variables that might be expected to lead to widely disparate patterns of ICT adoption, the organisation of daily life, and utilisation of ICTs (see Table 1). Methodologically, each ward was subject to a stratified postal survey (n=400) to establish baseline levels of ICT usage. This was followed by in-depth interviews with 50 respondents in each ward, and a similar number of technology-use diaries to try and track not just what people said but what they did, when, where and how often. All interviews were recorded and transcribed, then coded following an abductive approach, building inferentially on patterns in the material using NUD*IST qualitative analysis software (see Crang 1997, 2003).

TABLE 1 AROUND HERE

Blakelaw and Jesmond offer something of the contrast between the 'live'(tame) and 'dead'(tame) informational zones that Lash outlined. Blakelaw has a history as a dormitory neighbourhood for working class, manufacturing employees; Jesmond, meanwhile, is and has been a professional enclave oriented towards the information economy – but generally the 'safer' public sector and corporate jobs. The income profiles would lead us to expect varying adoption rates for ICTs and, indeed, 60% of our respondents from Jesmond but only 37% from Blakelaw had internet access at home (Table 2), a smaller gap than socio-

economic statistics would suggest. Despite stark income differentials, the digital divide was more complex, with a relative similarity in Broadband rates explained by its bundling with cable TV by the local service provider - and cable TV does not follow the same socio-economic profile as the Internet. So, for our neighbourhoods, the key factor in 'bandwidth' was not income but rather supply-side combinations of ICTs. But households with access to cable connectivity did not always use online services the most, and virtually no one used digital TV itself as the means to access the Internet.

TABLE 2 AROUND HERE

This pattern of access suggests that rising income is a significant, but far from exhaustive, predictor of Internet usage. In our sample (Table 3), 16.7% of all respondents in Blakelaw (i.e. 26% of non users) and 3.6% in Jesmond (9% of nonusers) cited cost as a reason for not using the 'net -- a stronger income effect on choice than national data predicts. As far as the often-conjectured lack of social capital and skills as 'barriers to diffusion', only 3.3% of Blakelaw respondents (5% of non adopters) and a surprisingly larger 11.8% of Jesmond respondents (30% of non adopters) cited knowledge barriers. This flips the expectations of programmes which concentrate training initiatives on poorer wards as an alleged solution to urban digital divides. Such data accords with studies which suggest people are making pragmatic and relatively informed judgements about the use and value to them that particular ICTs will have (Crabtree, Nathan et al. 2002)

TABLE 3 AROUND HERE

Urban Digital Divides as Process;

Contrasts Between Pervasive and Episodic ICT Use

Our key analytic issue of was not the physical presence of absence of ICTs, but how ICT use varied between the two neighbourhood samples (Selwyn 2004, 347-8). In terms of looking up information, the proportions for the neighbourhoods followed the pattern of access, but around double the proportion from Jesmond (45%) used digital media for regular communication. Communicability, not information, tends to support feelings of social inclusion and quality of life (Anderson 2002). Several of our interview respondents argued that online access to information told them little they could not already find out - though more quickly and generally while staying at home. If we focus upon the orchestration of daily living, rather than information transmission, then patterns of usage were more skewed than access, with 16% of respondents from Blakelaw using internet banking, 10% paying bills online and 28% of respondents using internet shopping as opposed to 26% of the respondents from Jesmond using banking, 16% paying bills and 40% shopping online. If ICTs are enabling the acceleration of urban life, that acceleration was doubly concentrated among the connected.

As we explored patterns of usage, key issues emerged around the mode of ICT use and how these related to the broader logistics of everyday urban life between the two samples. It quickly became clear that 'conditions of inclusion and marginalization could not be treated as an "either–or" state' (Beck, Madon et al. 2004, 280). As Bromley (2004, 93) has suggested in the case of national UK data:

> 'Certain patterns start to become familiar: younger people, those with degrees, and high household incomes are more likely to make extensive use of the internet than are older internet users or those with fewer educational or economic resources (whose use tends to be restricted to just one or two

different applications). It is therefore perhaps more apposite to talk of digital *divides* rather than simply referring to it as a singular phenomenon.'

The pattern was of *multiple* social factors but also how *extensive* was people's use. Nationally, across the UK, 28% of personal users accessed the net at least once a day, 27% 'several times a week', 16% once or twice a week, 14% up to once a week and 16% once a month (ONS 2003). If we look at personal ICT time-use, rather than the physical access, we find men 'in higher professional and managerial occupations spend 4 hours per week in computer-related activities and similarly placed women, 3 hours per week. Those in manual occupations spend hardly 1 hour per week in these activities' (Gershuny 2003, 153). Our sample suggested how profound a difference this pattern of use makes, as the effects of ICTs cascade into other activities. The divide in use we found was not access per se but a pattern of pervasive use amongst affluent residents in Jesmond contrasted with cultures of episodic ICT use amongst the more marginalized residents of Blakelaw.

Our study suggested the existence of two distinct modes of ICT use: discrete, episodic ICT use – mostly for instrumental and specific reasons -- and a more constant style of pervasive ICT use. For pervasive users in our study – predominantly affluent and time-pressured professionals living in Jesmond -- various ICTs worked together to permeate, and continually orchestrate, their everyday lives. ICTs, in other words, become a taken for granted and always-on 'infrastructure' – a background assemblage of technologies and practices sustaining continuous multi-tasking involving many geographical scales of distanciated connection simultaneously.

Telephones were seen to be the most vital technology for modern life by both sets of respondents – though often mobile phones rather than landlines. This varied by area, though, with 45% in Jesmond feeling the phone was “essential” to their lives as against 25% in Blakelaw. How they became essential and what that actually means we shall see below. The mean use of land line telephone between the neighbourhoods was not statistically different -- in both areas two thirds of people used their land lines for less than 3 hours per week. It was notable, however, that the heavy users making 3-6 hours of calls a week were much more pronounced in Jesmond (34.2% of all users as against 18.7% in Blakelaw). There was a positive correlation of usage with income in Blakelaw, but not in Jesmond – suggesting an income threshold beyond which there is no further effect. However, within Jesmond 15% had more than one ‘phone line, while in Blakelaw only 5% did –and the most frequent reason given for multiple lines was to facilitate dial-up Internet access.

The second largest use of home telephones in Jesmond was communicating with work, with 7% using phones more to communicate with work than friends and family, while Jesmond respondents were also more likely to use phone connections to arrange finances, utilities and services. The dependence on pervasive access to mobile connections in Jesmond came through strongly in interviews where one user spent 10% of her interview narrating the gradual move of her mobile phone from a tool with a specific, limited purpose where uses were clearly demarcated, to a situation where it became an intrinsic and habitual component of the logistics of living – a background infrastructure orchestrating everything she did:

> R: I suppose it’s always like this, you get [a mobile phone] thinking 'well I'll have it for an emergency' and then you end up being one of those people standing at Tesco's saying 'they don't have fresh broad beans, do you want

> runner beans instead?' So I think what a sad soul I've turned into. But you can get that instant hit. […] its that kind of, I don't know, it just takes all the little wrinkles out of your life, you don't have to wait. You know, 'I need to consult you, is it OK' 'Yes it is fine' 'Oh that's marvellous' and it can happen and I think that's great so I've become one of those people who would never ever want to give up a mobile. (Interview 17, Jesmond).

This passage shows the gradual embedding of a technology, until it becomes essential for daily living, and both a purveyor and solution to discourses that demand instantaneity and the ability to orchestrate daily living for people moving through the city separately but interdependently. How ICTs pervade activities became clear in the time diaries of several Jesmond respondents who were unable to indicate when they used ICTs – because they were unable to indicate when, if ever, they did *not*. Thus, one Jesmond respondent simply drew lines all the way across the day in her time-diary to indicate constant use of phone and email. In the free entry sections she wrote ‘Constant emailing’, ‘Constant [internet access] at work’, ‘E-mails all day’. This person was not solely emailing all day, but there were no prolonged spells when she was not connected and in that sense the task of ‘doing’ email became continuously woven into her work.

Compare this with an episodic ICT user who worked with computers quite extensively and recorded a lot of communication activity in their diary, but who could record specific timed events: ‘9.10 : 3 work e-mails sent to colleagues’, or: 2pm ‘Check e-mails - receive 5 work tasks send 3 replies further 2 work’. We found these episodic users to be much more prevalent in Blakelaw than in Jesmond. Episodic users were able to demarcate quite precisely the times and spaces of ICT usage from the times and spaces of non-use. They

were also able to recall the specific reason for the shift from non-use to use and back again to non-use. Take, for example, the discussion with Interviewee 1 from Blakelaw:

> I: Will you use the email?
>
> R: I've used the email.
>
> I: Who do you email?
>
> R: Well I've emailed me family and friends. Oh, I booked me holiday, I've booked me holiday with [partner] last week on the internet. I did that, and that came through fine. […]
>
> I: How important, would you say, is the email and the Internet for organizing your daily routine?
>
> R: Oh no, not really, not for organizing me daily routine. But for the odd occasion when you want something done, it's come up trumps for me.

The respondent, with broadband access and a household income between £16-20,000, downplays the Internet's role in organising their *daily* life. But she recounts specific occasions when she gained benefits from individual ICT-mediated transactions. To episodic users, based overwhelmingly in Blakelaw, moments of ICT use thus remained notable and still carried a sense of being novel and separate from the wider background of a non-ICT enabled everyday life.

Contrast this with the effects noted by interviewee 17 from Jesmond, who prefers a mobile phone to email because she can turn it off or leave it in her bag while email is for her a constant, and demanding, presence:

> R: No because you've always got the freedom to switch [the mobile] off... when I haven't got it its because I've extracted myself or I've turned it off so I don't feel I'm kind of on a chain, whereas I actually do with email.

I: Oh you do with email?

R: Oh yes, because I think its addictive and you think, I know the... of course the thing is now I've got speakers, it goes 'bing bong' and I think I should turn them down because every time there's a 'bing' I go and see what it is.

I: You can switch the 'bing bong' off.

R: Yes, I know, yes I have, I thought I must do this because, I just feel, its like being a dog on a lead, you sort of get hooked into it, I know you, the idea of email is that people send you a message when its convenient or material, you look at it when its convenient to you, but I think increasingly that's not the case. You feel almost obliged to make instant response and if you neglect your emails and you go into them, and there's like, you know, two hundred and ten...'

Here, the hyper-connected, pervasive ICT user from Jesmond (occupationally one of the 'informational workers', with a household income over £60,000, who banks online, shops online and has broadband access) experiences ICTs not just as a solution to time-pressure and life speed-up, but as a cause of the problem. Indeed, in her interview, she valued the ability to disconnect, to 'extract herself', something she found hard to do even on evenings or on holiday as pervasive ICT use blurred the divisions between connected and non-connected spaces and times. If we look at her account in detail, we have to think that this technically connected person has not disabled the email alert, but instead articulates a sense of obligation about the messages – that they demand a speedy reply, there is an expectation and possibly sanctions for failure. Here we see articulated the notion of acceleration, but bound to a technology that is usually referred to as 'asynchronous' messaging. The synchronous real time conversation by telephone can by

contrast be avoided and disconnected, whereas email is felt as ‘chain’. Thus, this respondent can be unavailable for real time communication but email accumulates with a sort of awful inescapability. So she feels a shifting pressure from something that should enable her to choose when to read the messages to something demanding a response – a demand for immediacy that she finds in the expectations of senders. So these different ICTs are brought into her life in different ways offering her different amounts of control that are not determined by the technology itself. Many other examples of ICTs creating time-stress were found among the Jesmond sample, with interviewee 35, for example, arguing that:

> ‘there's a need to look at the clear downsides [of pervasive ICT use], I think it can be incredibly stressful, intrusive, I've heard other people say that their heart sinks, they're constantly trying to manage an inbox of emails, and this isn't just the ‘spam’ stuff this is the simple demands of work. ... there is simply too much information that comes through which I do think has an influence on people …There are countless ways in which it can be a source of stress, and I've heard many other people say that’.

This interviewee is not just stating their experience here but reproducing a popular discourse and reflexive self-understanding about information overload and the stresses of accelerating everyday life caused by pervasive ICT use. ‘Many other people’ are talking about this ‘busyness’. And yet, the broader empirical data suggest that work time is not expanding. So here we may be seeing an intensification of work within a given time, the production of new work (having to ‘manage an inbox’) or the social valorisation of ‘busyness’ as a badge of honour, a statement of importance and value for elite workers (Gershuny 2005). Notably, and in sharp contrast to the focus amongst episodic users on isolated moments of connectivity, these pervasive users’ stories highlighted moments of

*dis*connection from ICT use as aberrant and remarkable. Moreover, different communicative media – from texting to emailing, to 'phoning – were portrayed by such users as part of an overall ecology, with different strategies for each, but nevertheless all forming a communicative assemblage in which multiple systems are used together to sustain multiple, simultaneous, and continuous tasks. There is, then, a difference in strategies of use and outcome despite similar technical accomplishments. Thus, the dense interweaving of online and offline activities among the highly connected, where patterns of texting quick messages bleed through to email, where physical shopping and online ordering for convenience, orchestrating friends gathering via email circulars forms this pervasive infrastructure -- that is a qualitatively different experience from arranging to log on and getting a good deal for one isolated transaction through a comparison shopping web site.

Episodic ICT Access: The Importance of Neighbourhood and Social Mediation

If traditional access data derived from household surveys seems to underplay the effects of the digital divide on the one hand, they also tend to overstate urban digital divides as a structural binary simply dividing urban societies into two parts. This portrayal actually misses a large amount of ICT usage. Our study suggests in particular that episodic users tend to be under-reported in studies based on access, and their neighbourhoods thus not so 'dead' to digital flows. Most digital divide and household ICT access surveys, to be comparable to national data, ask questions on personal ICT use in the previous three months. Evidence from the ONS and our other methods suggests that this does not give a full picture. In several interviews, when asked about e-commerce, respondents would say that they had not used ICTs. However, further into the interview, they would suddenly

recall how they had bought something online through another person. Had we simply conducted a questionnaire then they might never have recalled their indirect and collectively mediated ICT access and thus we would have simply labelled such people as digitally excluded non-users. This concurs with ONS surveys of non-use of the Internet which introduced a new category in 2003 ‘someone else uses the net for me’ which comprised 10-15% of non-users, and in the ONS omnibus survey for 2003-04, 25% of users had accessed internet at someone else’s house, while British Social Attitudes data suggests 15% do so (Bromley 2004).

In our survey 9% of respondents from Blakelaw and 8% from Jesmond had accessed the internet from friends’ houses. This pattern and proxy access makes us conclude that surveys asking about physical Internet points of presence may well underestimate the infiltration of that media. Interviews repeatedly found the benefits of cheap e-commerce provision, especially of travel purchases, spread much further than hardware provision suggests. Take, for example, Interview 15 (Jesmond):

> I: [have you shopped on the Internet?]
>
> R: Me personally, no. Well you see my children will use it for me in that if, for example, one of them will ring up and say 'I've found you a cheap holiday mum' or I'll ring them and say, because we go over to France a lot, and I'll say 'I'm looking for a cheap crossing', 'Oh leave it with me mum I'll find you one'. And em, they do it for me.

Using other’s knowledge of good deals and products through social networks is nothing new, and can be found in shopping practices from markets to department stores. But it emphasises that, far from a purely individual practice amongst atomised people or households, here e-commerce emerges as a *social* affair. These episodic users tend to

focus on discrete high value transactions, where there is a clear financial benefit and standard product. The standard product means that these can be delegated purchases. So below we see a respondent from Blakelaw (Interview 1), who started by saying that they did not shop on the Internet. Through the course of the interview, however, the interviewee kept recalling instances where they had done so but through collaboration:

> R:… I don't think I'll use it for shopping. I don't think I will. But saying that, for any big items, I not saying I wouldn't do it for that, for a washing machine for instance, for a television. Well actually I have done it for a television, the television up in my bedroom. But, it was done, me niece done it for us, she went onto Tesco's and done it and that.

This is not some delocalised realm of e-commerce, but the embedding of ecommerce via local social networks. Nor were these examples of socialised e-commerce tenuous or infrequent events. Often, they were widespread and quickly facilitated. In the excerpt below, the Blakelaw respondent ends up listing five separate people, all in the local neighbourhood, who shop online for her:

> I: Do you use the internet at all?
>
> R: No, em, I don't go on it personally, but if I need to know anything my daughter or my son, they get it up, because they just live within a few minutes, and I just phone them, they sort things out for me over the internet. If I want a railway ticket or something like that, because sometimes when you go on the internet you get deals, you know. […] I don't need to, because as I say I've got my son or my daughter, you know, who've got them. Actually my sister's have all got them, well two of my sister's. […] one of them, she just lives up the road. And [another resident] she's got a computer and they're on the internet as well. (Interview 12).

What this suggests is less an absolute divide of access between ICT users and non-users separated out amongst the various zones of polarised urban landscapes, and more a set of digital divides marked by contrasts in time-space modes of ICT use. We found people without 'access' in conventional measures, who, whilst not able to use the 'net themselves, were nonetheless able, via telephone in the above excerpt, to exploit existing offline, local social networks to indirectly access the benefits of online commerce. But, in the above quote, note how it is still remarked upon who does have a computer, and that this social network while local is doubly mediated – her children live within a few minutes but she phones them to access the Internet for her. In Jesmond, this social access occurred very largely within households with numerous respondents saying they did not shop or bank online because their partner dealt with those things. In Blakelaw, however -- with its low residential mobility and dense, stable, familial and neighbourhood networks – indirect, socialised uses of ICTs often also extended beyond the household.

These socialised contacts, moreover, appeared much more significant than 'public access' provision in libraries or kiosks. UK national figures suggest that 8-9% of users access the Internet via internet cafés and 7-10% via library or community centres (ONS National Omnibus survey 2004). However, in our sample, only some 4% of respondents from Blakelaw, and 12% of respondents from Jesmond, accessed the internet from internet cafés, and 7% of respondents from Blakelaw and 12% of respondents from Jesmond access the internet from their local library. Despite the implementation of 'e-phones' and kiosks in Newcastle, we found only one respondent who had used them (and that was only once). In other words, not only does the presence of these public facilities not appear to provide meaningful access, they are slightly more likely to benefit the better off community with the competences, expectations and incentives to use them when they available.

However, our analysis suggests that socialised access at the neighbourhood level in Blakelaw is unable to provide all the benefits received through individual or household online services. These networks are mobilised for specific tasks where there is an overriding financial benefit and a simple product. For poorer residents of Blakelaw, though, there were limits to this process. Probing online banking and payment of bills – often offering preferential account rates – we found disproportionately less use in Blakelaw. Online banking and utility accounts are linked to private access. In Blakelaw interviews, we also found preferences for unmediated 'local provision' based on face to face physical branch offices. Often, this provision was no more accessible in Blakelaw than it was in Jesmond, yet physical access was felt as more empowering and direct by Blakelaw respondents, where mediated access was often regarded with suspicion and as an obstacle, while Jesmond residents stressed digital services' convenience in terms of time of access, overcoming spatial distance and speed. The ideological connotations of the media and lack of access were thus almost directly opposite in the two areas of the study (see also Schofield-Clark et al 2004).

Conclusions

Our evidence in this paper suggests that new imaginations of urban digital divides are urgently required. Moving away from a preoccupation with mapping the diffusion of physical ICT access facilities within and between the geographies of cities, attention needs to shift, rather, to the ways in which varying modes of ICT use are constructed to unevenly reshape the times, spaces and logistics of everyday urban life between wealthier and less wealthy groups and areas in cities.

By taking such an approach, this study has shown that the relationships between urban inequality and ICTs relate less and less to stark, binaried geographies of access or lack of access. Rather, digital divides increasingly entail contrasts in modes, styles, temporalities, and intensities of ICT use. These imply that the ways in which ICTs are being unevenly used reshapes the temporal, spatial and logistical constraints that characterise urban inequalities, mediates individual and collective relationships in new ways, and requires careful attention. On the one hand, then, our study suggests that affluent neighbourhoods tend to be associated with pervasive ICT use through which multiple ICTs systems are configured together as an 'always-on' and background infrastructure orchestrating complex and speeding-up logistical, home and work lives. Whilst certainly enrolling the capacities of ICTs for relatively privileged and powerful users, the resultant 'time-crunch', and the proliferating interactions generated by need to coordinate ever more extended, multiscalar and complex networks of tasks, tends to also result in an increasing sense of stress for users (Southerton 2003).

Here, ironically, the *absence* of ICTs is both feared and craved; ICTs become so normalised as the transactional glue holding together everyday life that moments and spaces where they are *not* underpinning complex logistical negotiations actually become most noticeable. There is, thus, a dialectical relationship between the orchestrational and liberating capacity of ICTs. For such technologies hold:

> 'the promise to help people cope with the compression and fragmentation of time. But in so doing they lock their users into certain practices and habits, at the same time requiring an extensive if routinely invisible supporting infrastructure' with the 'unintended consequence of tying people into an ever denser network of inter-dependent, perhaps even dependent, relationships

with the very things designed to free them from just such obligations' (Shove and Southerton 2000, 315).

Moreover, the organisational webs mediated through pervasive use of ICTs become more flexible, multiscaled and complex to manage when:

> ‘by speeding things up, or offering increased flexibility, contemporary technologies, systems and infrastructures of mobility permit the fragmentation of episodes into smaller and smaller 'units' thereby increasing the challenge of co-ordinating what become separate events. In addition, and in order to cope, individuals adopt responsive strategies that enhance their ability to follow space-time trajectories of their own choosing. But when everyone else is doing the same, the problem of co-ordination increases further’ (Shove 2002, 5).

The need for different ICTs is thus evolving, not static. The tasks for which ICTs are necessary change. For a long time, techno-advocates have seen ICTs as a ‘good thing’ and necessary when many people still see them as incidental to their life (Crabtree, Nathan et al. 2002, page 5). The digital divide had not been ‘impacting’ on people’s daily routines. However, as ICTs become bound into the warp and weft of everyday life, activities come to depend upon them. We had asked respondents whether they used email, PCs and mobile phones instead of going places, and it became clear from the replies this question did not really make sense to them. In terms of PCs, they could talk about online purchases. But for pervasive users, and almost everyone with mobile phones, the answers broke down. These ICTs were so bound in to co-dependent patterns of action and mobility that it was no longer possible to conceptually disentangle them – physical movement depended upon the ability for mediated contact, and mediated contact was

necessitated by patterns of activity. The import of this integration of ICTs as part of the infrastructure holding complex lifestyles together, is that the consequences of not having those technologies actually become more significant. Finally, our study suggests that pervasive ICT users do seem to have much more individualised usage practices than episodic users . In affluent, professional neighbourhoods where pervasive ICT use is increasingly normalised, collective use of ICTs tends to operate, if at all, purely within households and at the level of the family. Here, mediated links are used to sustain real life networks.

Conversely, our study suggests that, in many lower income and more marginalised neighbourhoods, ICT use remains largely episodic. Whilst physical ICT facilities are present to an increasing degree, they tend to be used for specific, instrumental purposes, and then switched off. Notably, specific ICT uses remain strongly demarcated in space and time from wider, everyday urban lives still marked by a reliance on traditional cash economies, face to face services, and the need to physically travel to sustain economic and commercial transactions and social and familial links. Here, especially in neighbourhoods like Blakelaw, which have relatively low social turnover and very deep and stable social networks, our study suggests that ICT use tends to be more collective and collaborative and less individualised than amongst pervasive ICT users.

Importantly, such collective, collaborative, and episodic ICT use tends to be largely invisible to conventional digital divide mapping studies. Amongst episodic users, the limited times and spaces where ICT connectivity is made remain notable and distinct from the wider background of everyday life. Whilst such users may escape the time pressures of pervasive users, it is also clear that their continued reliance on physical cash, physical services and face to face contacts are likely to be seriously threatened as ICT- based

public and private service provision systems become both normalised and used as a rationale for the widespread withdrawal of non-online and face to face alternatives.

Amongst episodic users, ICT use is strongly mediated by neighbourhood social relations – where real world relations sustain online possibilities. In this sense, the neighbourhood effect of Lash's 'tame', stable places acts to enable informational access rather than ICTs resulting in turbulent 'wild' flows. Again, such neighbourhood and socially mediated ICT effects remain largely ignored within urban digital divide literatures. Such effects suggest that strong local social and neighbourhood relations may work to ameliorate urban digital divides, in that having local social networks including people who go online is more useful that having public access without such networks. Indeed, our evidence suggests that public access provision benefits the more affluent more transient neighbourhood disproportionately. This may suggest thinking through the issue not as public provision of access to artefacts – socialised use can enable that – but thinking through what activities would benefit from what public terminals.

Finally, our study suggests major implications both for the future study of urban digital divides, and for policy initiatives aimed at ameliorating them. Drawing from our conceptual and empirical perspective on multispeed urbanism, the digital inequalities of cities are not sustained by stark and dualistic geographies separating information 'haves' and 'have nots.' Rather, we would argue that conceptualisations now need to centre, first, on variable styles and speeds of ICT use, and, second, on the diverse ways in which such styles and speeds support, or inhibit, transformations in the logistics of everyday urban life for different groups of users.

Two particularly important distinctions, according to our research, are between instrumental and episodic ICT users on the one hand and users for whom new media constellations are a pervasive, increasingly taken for granted, and culturally invisible underpinning of everyday life on the other. Our choice of contrasting neighbourhoods presents them as perhaps too stark a contrast. We would suggest what we see is an axis of intensity of use. This is clearly not just a function of income, but work versus leisure habits, income and education. The issue is what benefits people are deriving from access, and indeed what pressures, and how this is configuring lives. The configuration of what is done online and what offline and why, is what shifts – not simply having access. Nor is it simply the case that 'going online' is a sign of privilege. An affluent consumer may preview online, but examine goods in person; they may buy in person but phone elsewhere for advice while in the store, and pay online later; a poor consumer may get a friend to purchase online for economy and pay that friend by cash in instalments. [i]

Such a perspective suggests that looking at the ways in which ICTs are being enrolled in attempts to enhance organisational capacities and orchestrate the time-space logistics of everyday life reveals striking differences which are usually ignored in both urban digital divide studies and policy initiatives. Moreover, it suggests that a major divide in the logistical enrolment of ICTs into urban life -- between episodic, often socially mediated use and pervasive use where the organisational power and tempo of life are more deeply mediated – is emerging which will profoundly influence the ways in which ICTs relate to urban inequality in the next decade.

Four important research questions emerge here which are beyond the scope of the current paper and which might therefore prove useful foci for future research. First, how do patterns of pervasive and episodic ICTs work to shape the broader social inequalities

within cities, as ICT-mediated consumption, work and communication becomes ever-more normalised, assumed, and taken for granted, and so are used to radically restructure urban geographies of service provision? Second, what social and economic advantages do pervasive user communities attain and, conversely, how does episodic ICT use work to shape the broader prospects of marginalised groups and neighbourhoods? Third, can episodic user communities eventually migrate towards pervasive use over time as broadband and wireless connectivities diffuse through city geographies and broader styles of ICT use become normalised beyond the 'early adopters' and their neighbourhoods? As interactive content becomes part of mobile phones and digital TV, will this pull more into a pervasive moving between media? Finally, how can urban digital divides shaped by contrasts between pervasive and episodic user communities be addressed through innovations in public and social policy?

Acknowledgement

This research was made possible by a grant from the ESRC for the project 'Multispeed Cities and the Logistics of Everyday Life' (RES-335-25-0015) as part of the *E-Society* programme. The authors would like to thank various colleagues in conversations and presentations, and the four anonymous referees who were a model of constructive engagement.

References

Agar, J. (2004). Constant Touch: A Global History of the Mobile Phone. London, Icon Books.

Anderson, B. (2002). Information Society Technologies, Social Capital and Quality of Life, E-Living: Life in a Digital Europe.

Baum, S., Y. van Gellecum, et al. (2004). "Wired Communities in the City: Sydney, Australia." Australian Geographical Studies **44**(2): 175-92.

Beck, E., S. Madon, et al. (2004). "On the Margins of the “Information Society”: A Comparative Study of Mediation." The Information Society **20**: 279–290.

Bittman, M., J. M. Rice, et al. (2004). "Appliances and Their Impact: The Ownership of Domestic Technology and Time Spent on Household Work." British Journal of Sociology **55**(3): 401-23.

Bridge, G. and S. Giullari (2004). E- Neighbourhoods, Centre for neighbourhood Research.

Bromley, C. (2004). Can Britain Close the Digital Divide? British Social Attitudes – the 21st Report. A. Park, J. Curtice, K. Thomson, C. Bromley and M. Phillips. London, Sage**:** 73-95.

Brown, B. and K. O'Hara (2003). "Place as a Practical Concern of Mobile Workers." Environment and Planning A **35**(9): 1565 - 1587.

Compaine, B. (2001), The Digital Divide: Facing a Crisis of Creating a Myth? Cambridge, Ma.: MIT Press.

Crabtree, J., M. Nathan, et al. (2002). Reality IT: Technology and Everyday Life, Isociety, The Work Foundation.

Crampton, J. (2003). The Political Mapping of Cyberspace. Chicago, Chicago University Press.

Crang, M. (1997). Analyzing Qualitative Materials. Methods in Human Geography. R. Flowerdew and D. Martin. London, Longman**:** 183-196.

Crang, M. (2000). "Urban Morphology and the Shape of the Transmissable City." City **4**(3): 303-15.

Crang, M. (2003). Telling Materials. Using Social Theory. M. Pryke, G. Rose and S. Whatmore. London, Sage**:** 127-44.

Crang, M., T. Crosbie, et al. (2006). "Technology, Timespace and the Remediation of Neighbourhood Life." Environment and Planning A **38**.

Eriksen, T. H. (2001). Tyranny of the Moment: Fast and Slow Time in the Information Age. London, Pluto Press.

Gershuny, J. (2000). Changing Times : Work and Leisure in Postindustrial Society. Oxford, Oxford University Press.

Gershuny, J. (2002). "Mass Media, Leisure and Home It: A Panel Time-Diary Approach." IT & Society **1**(1): 53-66.

Gershuny, J. (2003). "Web Use and Net Nerds: A Neofunctionalist Analysis of the Impact of Information Technology in the Home." Social Forces **82**(1): 141-168.

Gershuny, J. (2004). "Domestic Equipment Does Not Increase Domestic Work: A Response to Bittman, Rice and Wajcman." British Journal of Sociology **55**(3): 425-31.

Gershuny, J. (2005). "Busyness as the Badge of Honor for the New Superordinate Working Class." Social Research **72**(2): 287-314.

Graham, S. (2002). "Bridging Urban Digital Divides? Urban Polarisation and Information and Communications Technologies (Icts)." Urban Studies **39**(1): 33-56.

Graham, S. (2005), “Software-sorted geographies”, Progress in Human Geography 29 (5): 562–580.

Graham, S. and A. Aurigi (1997). "Urbanising Cyberspace? The Nature and Potetnial of the Virtual Cities Movement." City: analysis of urban trends, culture, theory, policy, action **7**: 18-39.

Green, N. (2002). "On the Move: Technology, Mobility, and the Mediation of Social Time and Space." The Information Society **18**(281–292).

Hampton, K. and Wellman, B. (2002), “The not so global village of Netville”. In B. Wellman and C. Haythornthwaite (Ed.s), The Internet and Everyday Life, London: Blackwell. 345-371.

Holloway, D. (2005), “The digital divide in Sydney: A socio-spatial perspective”, Information, Communication and Society, **8**(2), 168-193.

Jain, S. (2002). "Urban Errands: The Means of Mobility." Journal of Consumer Culture **2**(3): 419–438.

Jarvis, H. (2005). "Moving to London Time: Household Co-Ordination and the Infrastructure of Everyday Life." Time & Society **14**(1): 133–154.

Lash, S. (2002). Critique of Information. London, Sage.

Laurier, E. (2001). "Why People Say Where They Are During Mobile Phone Calls." Environment & Planning D: Society and Space **19**(4): 485 - 504.

Little, S. (2000). "Networks and Neighbourhoods: Household, Community and Sovereignty in the Global Economy." Urban Studies **37**(10): 1813-25.

Loader, B., Ed. (1998). Cyberspace Divide : Equality, Agency and Policy in the Information Society. London, Routledge.

Mackenzie, A. (2005). "Untangling the Unwired: Wi-Fi and the Cultural Inversion of Infrastructure." Space and Culture **8**(3): 269-285.

National Telecommunications and Information Administration (1999). Falling through the Net: Defining the Digital Divide:A Report on the Telecommunications and Information

Technology Gap in America. Washington, DC, Department of Commerce.

National Telecommunications and Information Administration (2000). Falling through the Net, toward Digital Inclusion: A Report on Americans' Access to Technology Tools. Washington, DC, Department of Commerce.

National Telecommunications and Information Administration (2002). A Nation Online: How Americans Are Expanding Their Use of the Internet. Washington, DC, U.S. Department of Commerce.

Perrons, D. (2003). "The New Economy and the Work-Life Balance: Conceptual Explorations and a Case Study of New Media." Gender, Work and Organization **10**(1): 65-93.

Policy Action Team 15 (2000). Closing the Digital Divide : Information and Communication Technologies in Deprived Areas. London, Department of Trade and Industry.

Pratt, A. (2002). "Hot Jobs in Cool Places. The Material Cultures of New Media Product Spaces: The Case of South of the Market, San Francisco." Information, Communication and Society **5**(1): 27-50.

Rice, R. E. and J. E. Katz (2003). "Comparing Internet and Mobile Phone Usage:Digital Divides of Usage, Adoption, and Dropouts." Telecommunications Policy **27**: 597–623.

Schofield Clark, L., C. Demont-Heinrich, et al. (2004). "Ethnographic Interviews on the Digital Divide." New Media and Society **6**(4): 529-47.

Selwyn, N. (2004). "Reconsidering Political and Popular Understandings of the Digital Divide." New Media and Society **6**(3): 341-62.

Shove, E. (2002). 'Rushing Around: Coordination, Mobility and Inequality'. Mobile Networks, Department of Sociology, Lancaster University, Lancaster LA1 4YN, UK.

Shove, E. and D. Southerton (2000). "Defrosting the Freezer: From Novelty to Convenience." Journal of Material Culture **5**(3): 301-319.

Silverstone, R. and E. Hirsch, Eds. (1992). Consuming Technologies: Media and Information in Domestic Spaces. London, Routledge.

Southerton, D. (2003). "'Squeezing Time': Allocating Practices, Coordinating Networks and Scheduling Society." Time & Society **12**(1): 5-25.

Townsend, A. (2000). "Life in the Real-Time City: Mobile Telephones and Urban Metabolism." Journal of Urban Technology **7**(2): 85-104.

Townsend, A. M. (2001). "Networked Cities and the Global Structure of the Internet." American Behavioral Scientist **44**(10): 1698-1717.

Webster, F. (2001). "Re-Inventing Place: Birmingham as an Information City?" City **5**(1): 27-46.

Table 1: Jesmond and Blakelaw: Ward Characteristics 2001

	Blakelaw	Jesmond
Population	11,300	9,700
No of Households	5,000	4,400
Ethnicity (white)	97%	93%
% Working more than 49hrs per week	17% ♂ 4% ♀	30% ♂ 16% ♀
% in all professional/ managerial SEC	18%	41%
% moved in last twelve months	6% (1% from outside city)	21% (50% from outside city)
% households with PCs	17%	40%

Source: UK Office of National Statistics, 2001 Census.

Table 2: Blakelaw and Jesmond: Types and rates of home internet access

Area of residence		%	Area of Residence		%
Blakelaw	Dial up	23.3	**Jesmond**	Dial up	41.3
	Broadband	13.3		Broadband	18.3
	No home internet access	63.3		No home internet access	40.4
	Total	**100.0**		**Total**	**100.0**

Table 3: Blakelaw and Jesmond: Reasons for not having home internet access

	Blakelaw Percent	*Jesmond Percent*	*National ONS 7/2004*
Cannot afford it	16.7	3.6	4.5
Have never thought about it	11.1	9.1	
Do not know how to use the internet	3.3	8.2	16
Don't know how to organise internet access	n/a	3.6	
Other	32.2	14.5	30
Has internet access in household	36.7	60.9	52

[i] We would like to thank one of Urban Studies' referees for some truly inspirational comments which we adapt here.